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TITLE

METHOD AND SYSTEM FOR NETWORK DEVICE UPGRADE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to networks, and in particular to a method and system using a computer system to upgrade network devices.

Description of the Related Art

Asymmetric digital subscriber line (ADSL) modem technology converts existing twisted-pair telephone lines into access paths for high-speed communications. ADSL modems transmit up to 1.5 Mbps upstream, and in interactive mode 640 kbps in both directions, increasing access capacity from 5.6k modem technology.

To increase ADSL modem speed, ADSL firmware must be upgraded. ADSL modems often have unique setup parameters, compared to existing environments. When ADSL modems undergo firmware upgrades, subnet mask and IP address changes to the ADSL modems cause problems when the upgrade computer system has different settings than the ADSL modem. Thus, ADSL modems must reset subnet mask and IP addresses individually before processing the upgrade.

SUMMARY OF THE INVENTION

Accordingly, the invention provides a method and system for network device upgrade, in which subnet masks of network devices are reset by a computer system issuing an upgrade command.

The system of upgrading network devices according to the present invention comprises a computer system, a switching device and a plurality of network devices.

The computer system outputs a first packet and a second packet. The first packet comprises at least version identification for upgrade data. The second packet comprises at least the upgrade data.

The switching device is connected to the computer system.

The plurality of network devices is connected to the switching device to receive the first and second packets. The plurality of network devices receives the first package to generate non-repetitive IP addresses corresponding to the computer system, wherein the plurality of network devices selectively generates an upgrade request according to the version identification data in the first packet and outputs the request to the computer system.

The method for network device upgrade utilizes a computer system and a plurality of network devices connected thereto. First, the computer system outputs a first package to the plurality of network devices, comprising at least version identification corresponding to upgrade data. After receiving the first package, the plurality of network devices generates non-repetitive IP addresses corresponding to the computer system. Thereafter, the plurality of network devices selectively generates an upgrade request and outputs the request to the computer system according to the version identification data of the upgrade data. Then, the computer system outputs a second package comprising the upgrade data to the plurality of

network devices according to IP addresses thereof, after which the plurality of network devices outputs an upgrade request to the computer system. Finally, the plurality of network devices executes upgrade utilizing the upgrade data in the second package.

The invention provides another method for network device upgrade for a network device utilizing an external computer system. First, the network device receives a first package comprising at least version identification corresponding to upgrade data. Then, the network device generates an IP address according to the first package and a media access control address of the network device, the IP address corresponding to subnet of the computer system. Thereafter, the network device generates an upgrade request according to the version identification data of the first package, and outputs the request to the computer system. Then, the network device receives a second package comprising at least upgrade data. The network device generates upgrade data according to comparison between the upgrade data in the second package and existing data from the network device. Finally, the network device writes new firmware according to the upgrade data to flash memory.

A detailed description is given in the following embodiments with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can be more fully understood by reading the subsequent detailed description and examples with references made to the accompanying drawings, wherein:

Fig. 1 is a schematic diagram showing the architecture of the system for network device upgrade;

Fig. 2 is a schematic view showing an indicator light system of the network device;

Fig. 3 is a flowchart illustrating the method for network device upgrade;

Fig. 4 is a schematic view showing the first package;

Fig. 5 is a schematic view showing the IP address.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 is a schematic diagram showing the architecture of the system for network device upgrade.

The system includes a computer system 10, network devices 30, 32, 34, and a switching device 20.

The computer system 10 outputs a first package and a second package. The first package comprises at least version identification for upgrade data. The second package comprises at least the upgrade data.

Network devices 30, 32, 34, TCP/IP protocol network devices, receive the first package and generate non-repetitive IP addresses corresponding to the computer system. Network devices 30, 32, 34 generate an upgrade request according to the version identification data and output the upgrade request to the computer system 10. Network devices 30, 32, 34 check a signature of the second package for validity. Network devices 30, 32, 34 compare the update data and existing data to generate upgrade data, and generate new firmware according thereto, which is then written to flash memory. The computer system 10 receives

the upgrade request, and outputs the second package to network devices 30, 32, 34 according to IP addresses thereof.

The switching device 20 is connected to the computer system 10 and network devices 30, 32, 34. The switching device 20 has several ports supporting TCP/IP protocol.

Network devices 30, 32, 34, via the switching device 20, connect to the computer system 10. The computer system 10, utilizing the switch, outputs the first package and the second package to network devices 30, 32, 34. Network devices 30, 32, 34, via the switching device 20, receive the first package and the second package.

Fig. 2 is a schematic view of an indicator light system of the network device, comprising a first WAN-LINK light 40, a second WAN-LINK light 42 and an alarm light 44.

Network devices 30, 32, 34 utilize indicator lights to report upgrade progress. The first WAN-LINK light 40 indicates successful connection between network devices 30, 32, 34 and the switching device 20. The second WAN-LINK light 42 indicates successful connection between a network card of the computer system 10 and the switching device 20. The alarm light 44 indicates connection failure. In Fig. 2 a circle represents constant light, a triangle flashing light, and a square no light.

The computer system 10 via the switching device 20 outputs a first package comprising an upgrade command, indicated by first WAN-LINK light 40 and second WAN-LINK light 42 being lit and alarm light 44 not lit, since network devices 30, 32, 34, via file transfer protocol, have received the upgrade command.

Indicator lights of network device 30, 32, 34 do not light when output of the upgrade command is unsuccessful.

The computer system 10 receives the upgrade request, and the switching device 20 outputs the second package, comprising upgrade data, according to IP addresses of the network devices. The first WAN-LINK light 40 and the second WAN-LINK light 42 are lit but the alarm light 44 is not when the network devices 30, 32, 34 receive the upgrade data.

Network devices 30, 32, 34 individually generate new firmware according to the upgrade data, and write the new firmware to flash memory of network devices 30, 32, 34. The first WAN-LINK light 40 and the second WAN-LINK light 42 flash and the alarm light 44 is out, accordingly. The first WAN-LINK light 40, the second WAN-LINK light 42 and the alarm light 44 are off at completion of the upgrade.

Fig. 3 is a flowchart illustrating the method for network device upgrade. Fig. 4 is a schematic view showing the first package.

First, in step S100, an upgrade application in the computer system, utilizing trivial file transfer protocol, outputs a first package 200 to network devices. The first package 200 comprises a data-link connection 210 (DLC), a logical link control 220 (LLC), an IP layer 230, a user datagram protocol 240 (UDP) and application data 250, wherein the IP layer 230 comprises a destination IP address, and the user datagram protocol 240 comprises a destination port. The application data 250 is 42b and comprises identification data.

In step S110, network devices generate non-repetitive IP addresses according to media access control address. Network devices receive the first package, and check the number of bytes of the first package and destination port. Network devices individually generate a subnet mask and a routing table corresponding to the computer system.

Fig. 5 is a schematic view showing the IP address. The IP address 300 comprises an immobile part 310 and an alteration part 320. The IP address 300 is 192.17.34.51. The alteration part 320 (17.34.51) of the IP address 300 is generated according to media access control address (0x11, 0x22, 0x33) of a network device. The immobile part 310 of the IP address 300 is 192.

In step S120, network devices selectively generate an upgrade request according to the version identification data in the first packet, generate the upgrade request according to a file name in the version identification data, and, utilizing file transfer protocol, output the request data to the computer system. The computer system outputs a second package, comprising upgrade data, to network devices according to IP addresses thereof.

In step S130, a new upgrade is generated by network devices by comparing the upgrade data with the second package and existing data stored therein.

Finally, in step S140, network devices generate new firmware according to the upgrade data, writing the new firmware to their flash memory. Network devices utilizing the new firmware only upgrade blocks differing between the upgrade data and the existing data.

The present invention provides a system and method for network device upgrade. A computer system updates IP addresses and subnet masks of network devices, making the upgrade more convenient and efficient and reducing costs for the factory and research and development department.

While the invention has been described by way of example and in terms of the preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications and similar arrangements (as would be apparent to those skilled in the art). Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.